

USSR

UDC 621.382.2:535.376

BRONSHTEYN, I. K., DOLGINOV, L. M., ZHITKOV, Yu. A., LIBOV, L. D., SHARIN, A. I., SHLENSKIY, A. A.

"Some Characteristics of Electroluminescent Diodes Based on Hetero PN Junctions in  $\text{AlGa}_{1-x}\text{As}$ "

Moscow, *Radiotekhnika i Elektronika*, vol 16, No 12, Dec 71, pp 2330-2332

**Abstract:** The authors investigate electroluminescent diodes based on the epitaxial heterostructure  $\text{P-GaAs}-\text{P-Al}_x\text{Ga}_{1-x}\text{As}-\text{N-Al}_y\text{Ga}_{1-y}\text{As}$  ( $x \approx 0.05$ ,  $y \approx 0.1$ ). The radiation from the  $\text{P-Al}_x\text{Ga}_{1-x}\text{As}$  layer propagates in a direction perpendicular to the PN junction through the transparent N-region. The emitting layer is doped with germanium to a hole concentration of about  $5 \cdot 10^{18}/\text{cc}$ , and the N-layer is tellurium-doped to an electron concentration of about  $10^{18}/\text{cc}$ . The area of the PN junction is about  $0.01 \text{ cm}^2$ . The electrical parameters of the diodes at room temperature: specific zero-bias capacitance of the PN junction about  $10^5 \text{ pF/cm}^2$ , current cutoff voltage 1.3-1.4 V depending on the mole fraction of aluminum arsenide in the solid solution, breakdown voltage 7 V, residual resistance 0.5 ohm or less.

1/2

USSR

BRONSHTEYN, I. K. et al., Radiotekhnika i Elektronika, vol 16, No 12,  
Dec 71, pp 2330-2332

An investigation of the principal electroluminescence characteristics of the diodes shows that they satisfy all the requirements for use as emitters in high-speed electron-optical devices. One figure, one table, bibliography of eight titles.

2/2

- 98 -

1/2 009  
TITLE--COMBINED USE OF SOME DRUGS IN ACUTE TOXOPLASMOSIS OF ALBINO MICE  
-U-  
AUTHOR--ZHITKOVA, G.M.  
COUNTRY OF INFO--USSR  
SOURCE--FARMAKOL. TOKSIKOL. (MOSCOW) 1970, 33(1), 106-10  
DATE PUBLISHED-----70  
SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES  
TOPIC TAGS--TOXOPLASMOSIS, SULFA DRUG, DRUG TREATMENT  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--1997/0193  
CIRC ACCESSION NO--AP0119189  
STEP NO--UR/0390/70/033/001/0106/0110  
UNCLASSIFIED

2/2 009

UNCLASSIFIED

PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0119189

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. ACUTE TOXOPLASMOSIS IN MICE WAS EFFECTIVELY TREATED BY A COMBINATION OF CHLORIDIN AND SULFAPYRIDAZINE AND BY AMINOQUINOL WITH SULFADIMEZINE, AND SOMEWHAT LESS EFFECTIVELY BY COMBINATIONS OF AMINOQUINOL WITH SULFAPYRIDAZINE AND OF CHLORIDIN WITH SULFADIMEZINE. COMBINATIONS OF CHLORIDIN OR AMINOQUINOL WITH MONOMYCIN WERE ALSO EFFECTIVE. CHLORIDIN PLUS AMINOQUINOL OR TRIPLE COMBINATION OF CHLORIDIN, AMINOQUINOL, AND SULFADIMEZINE WAS ONLY SLIGHTLY EFFECTIVE. FACILITY: KIRG. NAUCH. ISSLED. INST. OKHRANY MATERINSTVA DETSTVA. FRUNZE, USSR.

UNCLASSIFIED

USSR

UDC 621.375.82

ZHITKOVA, M. B., KLUSHIN, V. N., PORTNYAGIN, A. I., SHOKIN, A. A.

"Continuous Laser With a Vortex Lamp"

V sb. Kvant. elektronika (Quantum Electronics -- Collection of Works), No 3, Moscow, "Sov. radio," 1972, pp 24-29 (from RZh-Fizika, No 1, Jan 73, Abstract No 1D895)

Translation: The effect of the heat condition on the parameters of the active element of a YAG-Nd crystal under continuous pumping is analyzed. It is shown that in theoretical calculations it is necessary to take into account the variation, with temperature, of the crystal characteristics at high pumping levels. The laser pumping efficiency using krypton arc tubes is compared with that using a vortex discharge. The dependence of the spread of the output radiation and the focal distance of the thermal lens on the pumping power was investigated experimentally. The nature of the distribution of double refraction induced by optical pumping for the case of coincidence of the crystallographic plane [100] with the axis of the cylindrical active element is investigated. 10 ref. Authors' abstract.

1/1

- 22 -

USSR

UDC 534.26

ZHITKOVSKIY, Yu. Yu., Acoustics Institute, Moscow

"Relationship Between Reflection and Scattering of Sound by the Sea Bottom"

Moscow, Akusticheskiy Zhurnal, Vol 18, No 4, Oct-Dec 72, pp 533-536

Abstract: Different cases which may occur in measuring the effective coefficient of sound reflection by the sea bottom by normal incidence are analyzed, neglecting the water absorption of sound during its propagation and assuming the bottom to be an uneven interface of two media reflecting the total incident sound energy. The effective coefficient of sound reflection was found to be determined by the relation of the total intensity of scattered and coherently reflected by the sea bottom signals to the intensity of the sound wave incident on the bottom. The analysis of angular dependences of the sound scattering force by the sea bottom, obtained in regions with lightly broken bottom relief which, as a rule, are the regions of underwater ridges, shows that in these regions the effective coefficient of sound reflection by normal incidence is fully determined by the reverse scattering. In a case like that, it is not always rightfully to determine the reflection coefficient from the given formula. This conclusion holds good also for regions where the sound scattering from bottom in reverse direction is principally dependent on heterogeneities of the ground and is not following the Lommel-Zelinger rule. Eight formulas, eight biblio. refs.

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1/2 024 UNCLASSIFIED PROCESSING DATE--23OCT70  
TITLE--X RADIATION AND RADIO EMISSION OF LOCAL SOLAR SOURCES -U-  
AUTHOR-(03)-GELFREYKH, G.B., ZHITNIK, I.A., LIVSHITS, H.A.  
COUNTRY OF INFO--USSR  
SOURCE--MOSCOW, ASTRONOMICHESKIY ZHURNAL, VOL 47, NO 2, 1970, PP 329-339  
DATE PUBLISHED-----70  
SUBJECT AREAS--ASTRONOMY, ASTROPHYSICS  
TOPIC TAGS--X RADIATION, RADIO EMISSION, SUNSPOT, HELIOGRAM, RADIO  
TELESCOPE  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--2000/1399 STEP NO--UR/0033/70/047/002/0329/0339  
CIRC ACCESSION NO--AP0125044  
UNCLASSIFIED

2/2- 024

UNCLASSIFIED

PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0125044

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE EMISSION OF SOURCES OVER THREE SPOT GROUPS IN THE X REGION AND CENTIMETER RADIO EMISSION RANGE DURING THE PERIOD 16-30 JUNE 1967 IS COMPARED. X RAY HELIOGRAMS WITH A RESOLUTION OF SIMILAR TO 3 PRIME IN THE REGIONS 8-14 AND 6-10 A WERE OBTAINED FROM THE SATELLITE "KOSMOS 166". THE SPECTRA OF THESE SAME SOURCES IN THE CENTINETER RANGE WERE OBTAINED FROM OBSERVATIONS WITH THE LARGE PULKOVO RADIO TELESCOPE WITH A RESOLUTION OF 1-3 PRIME. IT WAS ESTABLISHED THAT THE RELATIONSHIP BETWEEN THE DEVELOPMENT OF SPOT GROUPS, X RADIATION AND RADIO EMISSION IS EXTREMELY COMPLEX: IN ADDITION TO SIMULTANEOUS VARIATIONS THERE WAS A CASE OF DECREASE IN X AND RADIO EMISSION WITHOUT ANY CHANGES IN THE SPOT GROUP; IN ONE CASE THE RESTORATION OF RADIO EMISSION FLUXES WAS NOT ACCOMPANIED BY ANY CHANGE IN X RADIATION. IN THE FORMATION OF A NEW GROUP THE RADIO SOURCE DEVELOPED APPROXIMATELY A DAY AFTER THE APPEARANCE OF CONSIDERABLE X<sub>i</sub> RADIATION. IT IS DEMONSTRATED WITHIN THE FRAMEWORK OF THE BREMSSTRAHLUNG MECHANISM AT SHOW WAVELENGTHS  $\lambda$  EQUALS 2-3.2 CM (AND NOT AT  $\lambda$  SIMILAR TO 10 CM, AS ASSUMED BEFORE); THAT RADIO OBSERVATIONS LIMIT THE EMISSION MEASURE TO INTEGRAL OF N SUBE PRIME2 DV IS SMALLER THAN OR SIMILAR TO 3 TIMES 10 PRIME48 CM PRIME NEGATIVE3, WHEREAS X RADIATION OBSERVATIONS INDICATE INTEGRAL OF N SUBE PRIME2 DV SIMILAR TO 3 TIMES 10 PRIME49 CM PRIME NEGATIVE3 AND T IS SIMILAR TO 2 TIMES 10 PRIME6K. FACILITY: MAIN ASTRONOMICAL OBSERVATORY ACADEMY OF SCIENCES USSR. FACILITY: PHYSICS INSTITUTE AND INSTITUTE OF TERRESTRIAL MAGNETISM. FACILITY: IONOSPHERE AND RADIO WAVE PROPAGATION.

UNCLASSIFIED



1/2 039 UNCLASSIFIED  
TITLE--INTERCOSMOS 1 IN ORBIT -U- PROCESSING DATE--23OCT70  
AUTHOR--(02)-TINOD, I.P., ZHITNIK, I.A.  
COUNTRY OF INFO--USSR, CZECHOSLOVAKIA, EAST GERMANY  
SOURCE--PRIRODA, NO. 4, 1970, P. 78-87  
DATE PUBLISHED-----70  
SUBJECT AREAS--SPACE TECHNOLOGY, ASTRONOMY, ASTROPHYSICS  
TOPIC TAGS--ARTIFICIAL EARTH SATELLITE, SOLAR UV RADIATION, SOLAR X  
RADIATION, PHOTOMETER, POLARIMETER, SPACECRAFT CARRIED EQUIPMENT, SOLAR  
FLARE, SPACE PROGRAM TECHNICAL ASSISTANCE/(U)INTERCOSMOS 1 SATELLITE  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAHE--2000/1490 STEP NO--UR/0026/70/000/004/0078/0087  
CIRC ACCESSION NO--AP0125118  
UNCLASSIFIED

2/2 039

UNCLASSIFIED

PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0125118

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. DESCRIPTION OF THE DESIGN AND EQUIPMENT OF THE INTERCOSMOS 1 SATELLITE LAUNCHED ON OCT. 14, 1969 IN THE SOVIET UNION FOR THE PURPOSE OF STUDYING UV AND X RAY SOLAR EMISSION AS A BASIS FOR THE PREDICTION OF SOLAR FLARES. THE SATELLITE CARRIED AN ALPHA PHOTOMETER, X RAY AND OPTICAL PHOTOMETERS, AN X RAY POLARIMETER, AN X RAY HELIOGRAPH, AND TV AND OTHER SYSTEMS MANUFACTURED IN THE SOVIET UNION, CZECHOSLOVAKIA AND EAST GERMANY. THE PERFORMANCE OF THE SATELLITE IS DISCUSSED BRIEFLY. FACILITY: AKADEMIIA NAUK SSSR, FIZICHESKII INSTITUT, MOSCOW, USSR.

UNCLASSIFIED

1/2 024  
UNCLASSIFIED  
TITLE--X RADIATION AND RADIO EMISSION OF LOCAL SOLAR SOURCES -U-  
PROCESSING DATE--23OCT70  
AUTHOR--(03)-GELFREYKH, G.B., ZHITNIK, I.A. LIVSHITS, H.A.  
COUNTRY OF INFO--USSR  
SOURCE--MOSCOW, ASTRONOMICHESKIY ZHURNAL, VOL 47, NO 2, 1970, PP 329-339  
DATE PUBLISHED-----70  
SUBJECT AREAS--ASTRONOMY, ASTROPHYSICS  
TOPIC TAGS--X RADIATION, RADIO EMISSION, SUNSPOT, HELIOGRAM, RADIO  
TELESCOPE  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--2000/1399  
STEP NO--UR/0033/70/047/002/0329/0339  
CIRC ACCESSION NO--AP0125044  
UNCLASSIFIED

2/2 024

UNCLASSIFIED

PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0125044

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE EMISSION OF SOURCES OVER THREE SPOT GROUPS IN THE X REGION AND CENTIMETER RADIO EMISSION RANGE DURING THE PERIOD 16-30 JUNE 1967 IS COMPARED. X RAY HELIOGRAMS WITH A RESOLUTION OF SIMILAR TO 3 PRIME IN THE REGIONS 8-14 AND 6-10 A WERE OBTAINED FROM THE SATELLITE "KOSMOS 166". THE SPECTRA OF THESE SAME SOURCES IN THE CENTIMETER RANGE WERE OBTAINED FROM OBSERVATIONS WITH THE LARGE PULKOVO RADIO TELESCOPE WITH A RESOLUTION OF 1-3 PRIME. IT WAS ESTABLISHED THAT THE RELATIONSHIP BETWEEN THE DEVELOPMENT OF SPOT GROUPS, X RADIATION AND RADIO EMISSION IS EXTREMELY COMPLEX: IN ADDITION TO SIMULTANEOUS VARIATIONS THERE WAS A CASE OF DECREASE IN X AND RADIO EMISSION WITHOUT ANY CHANGES IN THE SPOT GROUP; IN ONE CASE THE RESTORATION OF RADIO EMISSION FLUXES WAS NOT ACCOMPANIED BY ANY CHANGE IN X RADIATION. IN THE FORMATION OF A NEW GROUP THE RADIO SOURCE DEVELOPED APPROXIMATELY A DAY AFTER THE APPEARANCE OF CONSIDERABLE X RADIATION. IT IS DEMONSTRATED WITHIN THE FRAMEWORK OF THE BREMSSTRAHLUNG MECHANISM AT SHORT WAVELENGTHS  $\lambda$  EQUALS 2-3.2 CM (AND NOT AT  $\lambda$  SIMILAR TO 10 CM, AS ASSUMED BEFORE), THAT RADIO OBSERVATIONS LIMIT THE EMISSION MEASURE TO INTEGRAL OF N SUBE PRIME<sup>2</sup> DV IS SMALLER THAN OR SIMILAR TO 3 TIMES 10 PRIME<sup>48</sup> CM PRIME NEGATIVE<sup>3</sup>, WHEREAS X RADIATION OBSERVATIONS INDICATE INTEGRAL OF N SUBE PRIME<sup>2</sup> DV SIMILAR TO 3 TIMES 10 PRIME<sup>49</sup> CM PRIME NEGATIVE<sup>3</sup> AND T IS SIMILAR TO 2 TIMES 10 PRIME<sup>6K</sup>. FACILITY: MAIN ASTRONOMICAL OBSERVATORY ACADEMY OF SCIENCES USSR. FACILITY: PHYSICS INSTITUTE AND INSTITUTE OF TERRESTRIAL MAGNETISM. FACILITY: IONOSPHERE AND RADIO WAVE PROPAGATION.

UNCLASSIFIED

USSR

ZHITNIKOV, A. P.

UDC: 577.4

"Synthesizing Discrete Circuits by the Method of Induction"

V sb. Primeneniye vychisl. tekhn. v mashinostr. (Use of Computer Technology in Machine Building--collection of works), Izhevsk, 1971, pp 86-91 (from RZh-Kibernetika, No 8, Aug 72, Abstract No 8V425)

[No abstract]

1/1

- 19 -

Heat Treatment

USSR

UDC 621.791.019

ZEMZIN, V. N., Central Committee of Heavy Industry, and ZHITNIKOV, N. P.,  
Kirov Plant

"Fracture Conditions in the Near-Seam Zone of Welded Joints in Heat Treatment"  
Kiev, Avtomaticheskaya Svarka, No 2, Feb 72, pp 1-5

Abstract: The conditions under which the intersection of curves of stress-rupture strength and relaxation is conducive to fracture during heat treatment were investigated. Characteristics of the heat resistance of the initial metal and an imitated near-seam zone were determined on smooth and notched specimens of 15Kh1M1F steel normalized at 1050°C and tempered at 740°C. The results of short-term investigations at elevated temperature of fatigue strength and stress relaxation are analyzed. On the basis of experimental data and an analysis of the destruction process in the near-seam zone by creep, an outline for the development of fractures during heat treatment of welded joints is suggested. Fractures in the near-seam zone of welded joints of 15Kh1M1F steel can develop from stress concentrations which can be fractures, non-fusions, and sections of sharp transitions from the initial metal to the seam. Five illustration, nine bibliographic references.

1/1

USSR

UDC 621.791.05:669.15'24'25-194:620.183.669.786

ZHITNIKOV, N. P., Engineer, and ZAKS, I. A., Candidate of Technical Sciences

"Effect of Nitrogen on the Structure of Austenitic Weld Metal"

Moscow, Svarochnoye Proizvodstvo, No 8, Aug 71, pp 5-7

Abstract: The article describes results of a study of the effect of nitrogen on ferrite content in the structure of deposited chromium-nickel metal of the 20Cr-11Ni-2Mo-V and 20Cr-9Ni-Nb types, as well as the initial structure of ingots weighing 15 kg made of steel of the 20Cr-12Ni-Nb-V type. Estimates were made of the coefficients for the transition of nitrogen into the deposited metal from the electrode coatings into which the nitrogen was introduced as nitrated ferrochrome. In addition, the attempt was made to establish an analytic relation between the ferrite content of the metal structure and its chromium-nickel equivalents. Five batches each of electrodes were made with experimental coatings based on EA-400/10U electrodes applied to 4-mm-diameter Sv-04Kh19Ni1M3 wire and TsT-15-1 electrodes applied to 5-mm-diameter Sv-08Kh19Ni10B wire. Coatings were applied by the dip method. A bead 25 mm high and 20 mm wide was deposited by the multiple-bead method on plates of 0Kh18Ni10T steel.

1/2

USSR

ZHITNIKOV, N. P., and ZAKS, I. A., Svarochnoye Proizvodstvo, No 8, Aug 71, pp 5-7

It was found that the austenizing effect of nitrogen in chromium-nickel metal varies according to its content in the metal and the additional alloying of the metal with niobium, vanadium, molybdenum, and manganese. A formula is derived for calculating the ferrite content, and Delong's refined structural diagram is given. Coefficients are suggested for nitrogen in the calculation of nickel equivalents. An analysis of the calculation results shows that for an increased nitrogen content in metal built up with electrodes based on EA-400/10U and TsT-15 electrodes, coefficient 22 should be used for estimating the nitrogen in the nickel-equivalent formula, coefficient 26 for type 20-12 cast steel alloyed with niobium, vanadium, and nitrogen. For chromium-nickel metal containing up to 14 percent ferrite the ferrite content can be calculated directly according to the derived formula. There is a decrease in the coefficients for the transition of nitrogen into the deposited metal from the nitrated ferrochrome of the electrode coating with an increase in the nitrogen content of the coating. An analysis of type 20-12 steel was made by G. D. PIGROVA at the Central Scientific Research, Planning and Design Boiler and Turbine Institute imeni I. I. Polzunov.

2/2



USSR

UDC:621.791.052.01:620.192.4:669.15-194

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SHRON, R. Z., NIKANOROVA, N. I., KRECHET, L. E., Urals Heat-Engineering Institute, ZEMZIN, V. N. and ZHITNIKOV, N. P., Central Boiler and Turbine Institute

"Influence of Dispersion Hardening on the Tendency of Welded Joints in Chrome-Molybdenum-Vanadium Steels Toward Brittle Rupture at High Temperatures"

Moscow, Svarochnoye Proizvodstvo, No 12, Dec 73, pp 1-3

Abstract: This work studies the influence of dispersion hardening on the ductility and tendency toward brittle rupture at high temperatures of welded joints in steels types 12Kh1MF and 15Kh1MF. This study showed the influence of dispersion hardening in heated areas on the tendency of these alloys to local brittle ruptures during heat treatment and use in the untempered and low-tempered states. Heat treatment with high tempering increases ductility and the brittle-rupture resistance of these alloys. To prevent brittle rupture, the holding temperature of steam pipes during heat treatment should be at least 720° C.

1/1

- 59 -

USSR

UDC 621.791.011.08:620.178.2:669.15'24'25-194

ZHITNIKOV, N. P., Engineer, and ZEMZIN, V. N., Doctor of Technical Sciences

"Tendency of Welded Joints in Chrome-Nickel Steels Toward Brittle Rupture"

Moscow, Svarochnoye Proizvodstvo, No 10, Oct 70, pp 10-12

Abstract: A study was made of the influence of the thickness (rigidity) of welded elements, type of dressing, and mutual placement of welded seams on the residual deformation in the area near the seam in austenitic chrome-nickel steels. A simple test was devised for determining the tendency of welded joints toward crack formation near the seam during heat treatment and in the process of high-temperature operation. The studies indicated that the distribution of residual transverse deformations in the area near the seam is independent of specimen thickness: the magnitude of deformation increases with increasing specimen thickness. Transverse deformations in the area of the seam of a right angle edge are greater than deformations at an edge with an inclination of 45°. Study of specimens with two notches is recommended for the rapid estimation of the resistance to brittle (local) rupture during heat treatment and high-temperature operation of welded joints.

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ZHITNIKOV, R.A.

ZHITNIKOV

HELIUM SELF-OSCILLATING MAGNETOMETER WITH OPTICAL PUMPING OF He<sup>4</sup> ATOMS

UDC: 550.83.002.56

Article by R. A. Zhitnikov, P. P. Kuleshov, N. A. Dovator, and V. A. Azin  
(Physics-Technical Institute named A. F. Ioffe); Leningrad, *Izvestiya Akademiya Nauk SSSR, No 50, 1972, pp 5-9*

UDC 596.24  
146.73

(4)

For measuring the various parameters of a geomagnetic field, ever-increasing use is being made of the quantum magnetometers with optical pumping of the vapors of alkali metals and of metastable He<sup>4</sup> atoms. These magnetometers can be built according to a system with automatic frequency tuning of the (reference) oscillator toward the center of the working medium's resonance line or according to a self-oscillating system utilizing a spin-type oscillator (self-oscillating magnetometers). The self-oscillating magnetometers are simpler, more compact and reliable, and provide a higher operating speed.

The magnetometers using vapors of alkali metals as a working medium show the nonlinear dependence between the magnetic field which is being measured and frequency of signal which is being recorded, requirement of thermostat control over the absorption chamber, and asymmetry of resonance line.

Whereas the atoms of alkali metals have been employed in the development of self-oscillating magnetometers and magnetometers with automatic frequency tuning, the metastable He<sup>4</sup> atoms were used only in magnetometers functioning with optical pumping of metastable He<sup>4</sup> atoms [1, 2] permitted us to create a device ensuring the possibility of a spin-type oscillator and the advantages of He<sup>4</sup> as a working agent.

One of the basic difficulties in developing such a magnetometer was atoms' lower frequency (0.7-2.1 MHz) in the range of terrestrial magnetic fields. For the effective detection of light modulation with very length  $\lambda = 1.08 \mu$  microns at such frequency, we developed two types of special

Acc. Nr. AP0042368

Ref. Code: UR0203  
JPRS50162

Spin Generator with Optical Pumping for Quantum Magnetometers

(Abstract: "Spin Generator with Optical Pumping of Metastable He<sup>4</sup> Atoms for Quantum Magnetometers," by V. F. Afanas'yev, B. A. Zhitnikov and P. P. Kuleshov, Physical-Technical Institute imeni A. F. Ioffe, Moscow, Geomagnetizm i Aeronomiya, Vol. X, No 1, 1970, pp 183-184)  
Quantum magnetometers with optical pumping of atoms of alkali metals and He<sup>4</sup> atoms in a 2<sup>3</sup>S<sub>1</sub>-state are now in broad use. Helium magnetometers are quite preferable to those employing atoms of alkali metals. However, spin generators are being used with the latter, whereas no spin generator with satisfactory characteristics has yet been devised for the optical pumping of metastable He<sup>4</sup> atoms. The authors now report the development of a spin generator for the optical pumping of metastable He<sup>4</sup> atoms which make it possible to construct quantum magnetometers combining the advantages of optical pumping of He<sup>4</sup> atoms and the advantages of a spin generator. The principal difficulties in creating a spin generator for the optical pumping of He<sup>4</sup> atoms in a 2<sup>3</sup>S<sub>1</sub> state arise due to a relatively high resonance Larmor frequency of these atoms in the earth's magnetic field (~ 1.5 Mc/sec). Usually the photodiodes used in such apparatus have a large area of the p-n junction and due to a considerable capacitance have

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21

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a low response at this light modulation frequency and the signal-to-noise ratio at the required width of the feedback amplifier band is too small. This difficulty was overcome by using a specially developed photodiode of the p-i-n type which was adequately responsive in the required frequency range. Optical pumping of  $\text{He}^4$  atoms in a  $2^3\text{S}_1$  state is accomplished using circularly polarized light with a wavelength of  $1.083\mu$ . In the spin generator the light modulation signal at the Larmor frequency is fed to radio-frequency coils after amplification (the article is accompanied by a block diagram of the spin generator). The frequency range in which generation is observed is determined by the band of the feedback amplifier (in this case, 900-1,500 kc/sec, which corresponds to a range of magnetic fields from 32,000 to 54,000  $\gamma$ .) The signal-to-noise ratio in the generation band is not worse than 30:1.

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Li

USSR

UDC 77

ZHITNIKOV, R. A.

"Investigation of Neutral Silver and Copper Atoms in Various Systems by the EPR Method"

V sb. Mezhdunar. kongress po fotogr. nauke, Moskva, 1970, Priroda fotogr. chuvstvitel'nosti (International Congress on Photographic Science, Moscow, 1970, Nature of Photographic Sensitivity -- Collection of Works), no place of publication given, Vneshtorgizdat, no year given, pp 139-142 (from RZh-Fizika, No 12(I), Dec 70, Abstract No 12D1367)

Translation: The EPR method was used to study neutral atoms of the  $\text{Ag}^{109}$  isotope stabilized in various matrices: alkali-halide crystals, borate, phosphate and silicate glasses (including photochrome), chilled aqueous and alcohol solutions of Ag salts, adsorbed layers on the surface of silica gel; also investigated in certain of these matrices (alkali-halide crystals) were stable neutral atoms of  $\text{Cu}^{63}$  and  $\text{Cu}^{65}$ . The basic information on the properties of stable neutral atoms is given by the relative shift of the constant for the hyperfine

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USSR

ZHITNIKOV, R. A., Mezhdunar. kongress po fotogr. nauke, Moskva, 1970, Priroda fotogr. chuvstvitel'nosti, no place of publication given, Vneshtorgizdat, no year given, pp 139-142

structure of the EPR for the atoms in the given matrix as compared with free atoms. Corresponding data are given for all systems studied and it is shown that free  $\text{Ag}^+$  ions are present in photochrome glasses which are capable of capturing electrons under x-irradiation and transforming into  $\text{Ag}^0$  atoms. It is also shown that mutual transformations of Ag atoms and atomic centers are observed in these glasses under heating and illumination. Obviously, the study of stabilized neutral atoms of Ag in an AgHal lattice is also possible by the EPR method. A. L. K.

1/2 045  
UNCLASSIFIED  
PROCESSING DATE--09OCT70  
TITLE--OPTICAL ORIENTATION OF PRIME65 RB AND PRIME87 RB ATOMS BY LIGHT OF  
THE D SUB2 LINE AND RELAXATION IN THE PRIME2 P SUBTHREE HALVES STATE DUE  
AUTHOR--(04)--ZHITNIKOV, R.A., KULESHOV, P.P., OKUNEVICH, A.I., SEVASTYANOV,  
B.N.  
COUNTRY OF INFO--USSR  
Z  
SOURCE--ZHURNAL EKSPERIMENTAL'NOY I TEORETICHESKOY FIZIKI, 1970, VOL 58,  
NR 3, PP 831-842  
DATE PUBLISHED--70  
SUBJECT AREAS--PHYSICS  
TOPIC TAGS--OPTIC PUMPING, RUBIDIUM, INERT GAS, GAS PRESSURE, ROTATING  
MAGNETIC FIELD, ELECTRON ENERGY LEVEL, HYPERFINE STRUCTURE, EXCITED  
ELECTRON STATE  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--1977/0006  
STEP NO--UR/0056/70/058/003/0831/0842  
CIRC ACCESSION NO--AP0043606  
UNCLASSIFIED



2/2 045

CIRC ACCESSION NO--AP0043606  
ABSTRACT/EXTRACT--(U) GP-0-

UNCLASSIFIED

PROCESSING DATE--09OCT70

ABSTRACT. THE DEPENDENCE OF OPTICAL PUMPING SIGNALS OF RB ATOMS ON THE PRESSURE OF THE NOBLE GASES HE, NE, AR, KR AND XE IS INVESTIGATED. BY APPLYING A ROTATING MAGNETIC FIELD FOR SEPARATELY OBSERVING THE RESONANCE SIGNALS FROM TWO HYPERFINE STRUCTURE SUBLEVELS OF THE RB ATOM GROUND STATE ONE CAN FIND THE CHARACTERISTIC PRESSURE OF THE INERT GAS, P SUBO PRIME, AT WHICH THE SIGNAL OF THE HYPERFINE STRUCTURE SUBLEVEL WITH A LARGE PHI VALUE (PHI IS THE TOTAL MOMENTUM) VANISHES. THE VALUES OF P SUBO PRIME OBTAINED ARE EMPLOYED FOR CALCULATING THE CROSS SECTIONS FOR DISORIENTATION IN THE PRIME2 P SUBTHREE HALVES EXCITED STATE OF THE RB ATOMS DUE TO COLLISIONS WITH NOBLE GAS ATOMS.

UNCLASSIFIED

USSR

UDC 621.373.52-181.48

ZHITNIKOV, YE. I., SIMONOV, L. A., and MARTYNOVA, G. G.

"Generators Based on RC-Structures With Distributed and Lumped Parameters Made From Integrated Hybrid Circuits"

Sb. nauch. tr. po probl. mikroelektron. Mosk. in-t elektron. tekhn. (Collected Scientific Works on Problems in Microelectronics. Moscow Institute of Electronics Technology), 1972, vyp.10, pp 194-200 (from RZh-Radiotekhnika, No 11, Nov 72, Abstract No 11 D266)

Translation: The authors describe the principal circuits and present the results of the experimental studies of RC-generators based on integrated hybrid microcircuits. The studies were carried out within a broad range of frequencies from 3 cps to 10 Mc. Data are also given on the stability of the frequency and amplitude of RC-generators and on the control of the frequency of RC-generators with the aid of varicaps of p-n-junctions. Resume.

1/1

- 99 -

USSR

UDC 621.373.52-181.48

ZHITNIKOV, YE. I., VISHIN, M. G., and KORNEV, V. A.

"Generator of High-Stability Oscillations Based on Integrated Hybrid Microcircuits"

Sb. nauch. tr. po probl. mikroelektron. Mosk. in-t elektron tekhn. (Collected Scientific Works on Problems in Microelectronics. Moscow Institute of Electronics Technology), 1972, vyp. 10, pp 188-193 (from RZh-Radiotekhnika, No 11, Nov 72, Abstract No 11 D267)

Translation: The authors present the results from the development of a reference generator of high stability oscillations based on integrated hybrid microcircuits and designed for the production of stable time traces. The generator has two independent quartz thermostatically controlled exciters operating on one of the frequencies of the 150-200 kc range. Daily frequency instability and hourly frequency instability are ensured at not less than  $\pm 5 \cdot 10^{-7}$  and  $\pm 1 \cdot 10^{-7}$  respectively. The design of the generator makes it possible to operate under conditions of the effect of vibrations, impacts, linear acceleration, changes in external temperature, humidity, and pressure. Resume.

1/1

USSR

UDC 539.3.01

ZHITNYAYA, V. G., SOLOSHENKO, L. I.

"The Stressed State of a Half-Plane With Two Circular Openings"

V sb. Kratk. tezisy dokl. k Konf. po povrezhdeniyam i ekspluat. nadezhnosti sudovykh konstruktsiy, 1972 (Brief Subjects of Papers at the Conference of Breakdown and Utilization of the Reliability of Ship Designs, 1972 -- Collection of Works), Vladivostok, 1972, pp 47-51 (from RZh-Mekhanika, No 3, Mar 73, Abstract No 3V57)

Translation: The problem of the plane stressed state of a half-plane with two symmetrically located circular openings into which were soldered the nuclei of another isotropic material is discussed. Concentrated forces producing the plane stressed state and applied at the centers of the nuclei act on the body. An elastic potential making it possible to determine stresses and displacements in the nuclei and the half-plane is constructed for the given problem. K. A. Kitover.

1/1

- 67 -

USSR

UDC 532.529

ZHITOMIRSKIY, I. S., AL'TSHULER, L. L.

"System of Equations and Boundary Conditions Describing Dynamic Processes in Polydisperse Vapor-Liquid Flow"

Tr. Fiz.-tekhn. in-t nizk. temperatur. AN USSR (Works of the Physicotechnical Institute of Low Temperatures of the Academy of Sciences UkrSSR), 1970, No. 1, pp 89-101 (from RZh-Mekhanika, No 12, Dec 71, Abstract No 12B1483)

Translation: An arbitrary (nonstationary, three-dimensional) gas flow with liquid droplets of the same materials suspended in it is discussed. The droplets may have an arbitrary distribution as to dimensions or mass  $m$ . The difference in velocities and gas temperatures and drops of various sizes, thermal and dynamic interaction between the gas and the drops, and also the effects of evaporation and condensation are taken into account. Collisions between drops are considered to be unimportant and it is assumed that in the neighborhood of an arbitrary point of the space  $x$  at a given time  $t$  all drops of one size have the same velocity, temperature, etc. A complete system of equations is derived which describes the flow studied under these assumptions. This system includes equations of continuity, momentum and energy for the gas and liquid fraction of

1/2

USSR

ZHITOMIRSKIY, I. S., AL'TSHULER, L. L., Tr. Fiz.-tekhn. in-t nizk. temperatur.  
AN USSR, 1970, No. 1, pp 89-101

the drops and also the equations of state and expressions for forces, heat fluxes, condensation and evaporation rates, etc. The derivation of the conservation equations for the drops is described.

2/2

- 39 -

Higher Algebra & Geometry and Topology

USSR

UDC: 512.7

ZHITOMIRSKIY, G. I.

"Lattice for All Congruence Ratios in a Half-Lattice"

Saratov, V. sb. "Uporvadochennyye mnozhestva i reshetki" (Ordered Sets and Lattices--collection of works) No 1, Saratov University, 1971, pp 11-21 (from RZh--Matematika, No 4, 1972, Abstract No 4A338)

Translation: The element  $a$  of lattice  $L$  is said to be regular if from  $a \vee x = a \vee y$ ,  $a \wedge x = a \wedge y$  it follows that  $x = y$  for any  $x, y \in L$ , and is said to be distributive if any element triplet containing  $a$  is distributive. Let  $\mathcal{A}$  be a set of all simultaneously distributive regular and supplementary elements of the complete lattice  $L$ . For  $a_1, a_2 \in \mathcal{A}$ , we assume  $a_1 \leq^* a_2$  if and only if  $a_1 \leq a_2$  and  $a_1 \wedge a_2$  is a compact element in  $L$ . It is found that  $\leq^*$  determines the ordering in  $\mathcal{A}$ . The minorant subhalf-lattice  $I$  of the complete lattice  $L$  is said to be definitive if: 1) each element  $i \in I$  is  $\vee$ -irresolvable in  $I$ ; 2)  $I$  is the directed subset in  $(\mathcal{A}, \leq^*)$ ; 3) elements of the form  $i_1 \wedge i_2$  form the  $\vee$  basis of lattice  $L$ . Any congruence in the half-lattice  $I$  is said to be chiefly ideal if it has a unique, nontrivial class, the class being chiefly

1/2

USSR

ZHITOMIRSKIY, G. I., "Uporyadochennyye mnozhestva i reshetki", No. 1, 1971, pp 11-21

ideal in  $I$ . The principal result is: if the complete lattice  $L$  contains the definitive subhalf-lattice  $I$ ,  $L$  is isomorphic to the lattice of all congruences in  $I$ ; conversely, the lattice of all congruences in half-lattice  $I$  contains the definitive subhalf-lattices: the totality of all the chiefly ideal congruences. Thus, in the language of the second stage, class  $K$  of the congruence lattices is described in half-lattices. It is shown that class  $K$  is not axiomatized in elementary fashion. We note one consequence: each lattice with the supplements in class  $K$  is Boolean. V. Saliy.

2/2



USSR

UDC: 528.526.6

LAVROV, V. N., ZHITOMIRSKIY, I. B., LUKOVATYY, Yu. S., YAKOVLEVA, N. P.,  
VASIL'YEV, Yu. F., All-Union Scientific Research Institute of Mining Geo-  
mechanics and Surveying

"A Miniaturized Surveyor's Gyrocompass"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki,  
No 9, Mar 72, Author's Certificate No 331253, Division G, filed 21 Jul 67,  
published 7 Mar 72, p 117

Translation: This Author's Certificate introduces a miniaturized surveyor's  
gyrocompass which contains a theodolite with autocollimation system, a trig-  
ger and a gyro attachment with pendulum sensing element on a torsion suspen-  
sion and strip current feed. As a distinguishing feature of the patent, the  
design provides for compensation of the torque of the torsion suspension and  
the current feed. The current feed is made in the form of strips bent in  
the vertical or horizontal plane with their ends fastened to the sensing  
element at a distance  $r$  from its axis of rotation, where  $r$  is defined by  
the formula

$$r = aD \left( \frac{\sqrt{DK}}{IE} + b - c \right),$$

1/2

- 138 -

USSR

LAVROV, V. N. et al., USSR Author's Certificate No 331253

where  $D$  is the distance between the fixed ends of the current feed strips,  $K$  is the stiffness of the torsion suspension,  $a$ ,  $b$  and  $c$  are numerical coefficients which depend on the shape of the bend in the strips, and  $IE$  is the rigidity of the current feed strips.

2/2

Acc. Nr: **AP0055704**

Ref. Code: **Z1R0422**

PRIMARY SOURCE: Standarty i Kachestvo, 1970, Nr **2**,  
pp **60 - 61**

**Z**

Standards Protect Man Against Harmful Vibrations.  
V. K. Zhitomirskiy and I. V. Bergman. "Stan-  
darty i kachestvo", 1970, No. 2.

The article discusses GOST 13.731-68 *Vibration, me-  
chanical. General Specification of Measuring Methods.*  
The standard became effective in 1969.

**mk**

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REEL/FRAME

**19841013**

**2**

USSR

ZHITOVA, Ye. I., IPPOLITOVA, L. A., MINEYEV, A. M., SMOLINA, N. N.,  
and SIKREZH, N. P., Gor'kiy Medical Institute, Gor'kiy Oblast  
Sanitary Epidemiological Station, and Gor'kiy City Sanitary  
Epidemiological Station, Gor'kiy

"Diagnostic Significance of Lot Titers of the Complement Fixa-  
tion Reaction With Some Antigens"

Moscow, Zhurnal Mikrobiologii, Epidemiologii i Immunobiologii,  
Vol 48, No 2, Feb 71, pp 72-75

Abstract: Sera of patients and healthy persons giving a posi-  
tive reaction in the complement fixation test with ornithosis  
antigen also contained antibodies to R. prowazekii antigen in  
approximately 50% of cases. The relative frequency of ornithosis-  
R. prowazekii cross reactions increased with increasing titers  
of the R. prowazekii antigen at which a positive complement  
fixation reaction was obtained. To exclude diagnostic errors,  
repeated tests with both antigens should be carried out. Sera  
1/2

USSR

ZHITOVA, Ye. I., et al, Zhurnal Mikrobiologii, Epidemiologii i Immunobiologii, Vol 48, No 2, Feb 71, pp 72-75

that show positive complement fixation reactions with antigens of ornithosis, R. prowazekii, and Q-fever gave positive reactions with toxoplasmosis antigen (1:10 - 1:5) in more than 2/3 of cases.

2/2

1/2 016 UNCLASSIFIED PROCESSING DATE--13NOV70  
TITLE--MORPHOLOGICAL INNERVATIONAL MECHANISMS OF CEREBRAL ARTERIES AND  
VEINS -U-  
AUTHOR--ZHITSA, V.I.  
COUNTRY OF INFO--USSR  
SOURCE--ARKH ANAT GISTOL EMBRIOL 56(1): 27-36, ILLUS. 1970.  
DATE PUBLISHED-----70  
SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES  
TOPIC TAGS--CEREBRUM, BLOOD CIRCULATION, ANATOMY  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAE--3002/1053 STEP NO--UR/9076/70/058/001/002//0036  
CIRC ACCESSION NO--AP0128402  
UNCLASSIFIED

2/2 016

UNCLASSIFIED

PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AP0128482

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. PATTERNS OF INNERVATION WERE STUDIED AT EVERY LINK OF INTRACRANIAL AND INTRACEREBRAL ARTERIAL AND VENOUS CIRCULATION ON TOTAL PREPARATIONS, IMPREGNATED ACCORDING TO VARIOUS TECHNIQUES (BIELSCHOWSKI-GROSS, RASSKAZOVA, GOMORI, FOR ACID PHOSPHATASE). LARGE VASCULAR TRUNKS POSSESS IMPORTANT NERVE STRUCTURES MADE UP OF NERVE STEMS OF DIFFERENT THICKNESS, BUNDLES AND NUMEROUS SINGLE MYELINATED AND NONMYELINATED NERVE FIBERS. THESE FORM MULTIPLE RAMIFICATIONS AND JUNCTIONS. THE VESSEL SURROUNDED BY 3 SUCCESSIVE NETWORKS ABOUT AND WITHIN ITS WALL (PERIVASAL, SUPERFICIAL ADVENTITIAL AND DEEP ADVENTITIAL). AS THE CALIBER OF EACH VESSEL DIMINISHES, THE STRUCTURE OF ITS NERVE SUPPLY BECOMES LESS COMPLICATED. VARIOUS FORMS OF SIMPLE OR COMPLICATED, FREE OR INCAPSULATED RECEPTORS ARE REVEALED, AS TUFTS, GLOMERULI AND TERMINATIONS OF A "CLIMBING" TYPE. WITH DUE CONSIDERATION TO THE FORM OF PRETERMINAL ARBORIZATION, PRESENCE OR ABSENCE OF SECONDARY FEATURES, THESE NERVE ENDINGS ARE DESCRIBED AS "TENSOR RECEPTORS" AND CHEMORECEPTORS". OVER MAIN AND OTHER VESSELS OF THE BRAIN STEM AND IN THE PIA MATER OF THE SAME REGION, A VARIETY OF SENSORY AND VEGETATIVE NERVE CELLS ARE FOUND. THEIR PROCESSES ARE INTERWOVEN WITH THE NERVE SUPPLY OF THE CEREBRAL VASCULAR SYSTEM. THE NERVE CELLS AND THEIR RECEPTOR UNITS MAY PLAY A CERTAIN PART IN LOCAL REFLEXES RESPONSIBLE FOR COORDINATING THE DISTRIBUTION OF BLOOD FLOW WITHIN THE ORGAN, DEPENDING ON THE INTENSITY OF PROCESSES GOING ON IN DIFFERENT PARTS OF THE BRAIN. FACILITY: DEP. NORM. ANAT., KISHINEV STATE MED. INST., KISHINEV, USSR.

UNCLASSIFIED

USSR

UDC 621.396.6.019.3

KOFANOV, Yu. N., GIREL, P.M., ZHIV, M. I.

"Mathematical Expectation and Investigation of the Parametric Sensitivity of Converter Circuits with Modulation"

Metody razrab. radiotelektron. apparatury. Materialy Seminara. Sb. 2 (Methods of Developing Radioelectronic Equipment. Materials of the Seminar. Collection 2), Moscow, 1970, pp 60-65 (from RZh-Radiotekhnika, No 8, Aug 70, Abstract No 8A183)

Translation: This article contains a study of a multiphase converter using a mathematical model described by a system of linear differential equations with aperiodic coefficients. As an example, a single phase autonomous parallel inverter is considered. There are two illustrations and a three-entry bibliography.

1/1



1/2 026 UNCLASSIFIED PROCESSING DATE--02OCT70  
TITLE--DYNAMIC MECHANICAL PROPERTIES OF MULTICOMPONENT POLYMERIC  
COMPOSITIONS -U-  
AUTHOR--(05)-AIVAZOV, A.B., ZHIVAYEV, V.YA., NIKIFOROVA, A.V., ZELFNEV,  
YU.V., TYURINA, V.S.  
COUNTRY OF INFO--USSR  
SOURCE--MEKH. POLIM. 1970, 6(1), 138-41  
DATE PUBLISHED-----70  
SUBJECT AREAS--MATERIALS  
TOPIC TAGS--ELASTIC MODULUS, CARBON BLACK, POLYISOPRENE, POLYSTYRENE  
RESIN, POLYPROPYLENE, POLYVINYL CHLORIDE, LOW TEMPERATURE EFFECT, HIGH  
TEMPERATURE EFFECT/(U)SK13 POLYISOPRENE, (U)SKM530 METHYLSTYRENE RUBBER  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--1989/0815 STEP NO--UR/0374/70/006/001/0138/0141  
CIRC ACCESSION NO--AP0107357  
UNCLASSIFIED

2/2 026

UNCLASSIFIED

PROCESSING DATE--02OCT70

CIRC ACCESSION NO--AP0107357

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE DYNAMIC ELASTICITY MODULUS (F) AND TAN(MECH. LOSS ANGLE) WERE DETD. FOR BINARY (RUBBER PLASTIC) AND TERNARY (RUBBER, PLASTIC, CARBON BLACK (I)) SYSTEMS BY THE METHOD OF FORCED NON RESONATING VIBRATIONS. THE TEMP. DEPENDENCE OF E PERMITTED TO CALC. THE ACTIVATION ENERGY (U) OF E CHANGE. IN THE LOW TEMP. REGION (SIMILAR TO MINUS 50DEGREES) U IS 13.4-13.8 KCAL-MOLE; IN THE HIGH TEMP RANGE (SIMILAR TO 160-5DEGREES) U IS 21.9-28.7 KCAL-MOLE FOR THE FOLLOWING AND SIMILAR SYSTEMS: 100:20 SKI-3-POLYPROPYLENE (III); 100:15 SKMS-30-II; 100:60 SKI-3-I; 100:10:60 SKI-3-MARBON 8000 A-I; 100:10:60 SKI-3-POLY(VINYL CHLORIDE)-I.

UNCLASSIFIED

RSSR

UDC 621.791.72:669.15-194

KASATKIN, B. S., Doctor of Technical Sciences, KOVBASENKO, S. N.,  
Engineer, NAZARENKO, O. K., Candidate of Technical Sciences,  
ZADERIY, B. A., Engineer, and ZHIVAGA, L. I., Engineer, Electric  
Welding Institute imeni Ye. O. Paton of the Academy of Sciences  
UkrSSR

"Electron-Beam Welding of Low-Alloy 14Kh2GMR Steel"

Kiev, Avtomaticheskaya Svarka, No 7(244), Jul 73, pp 4-8

Abstract: A study was made of the characteristics of electron-beam welding of high-strength low-alloy 14Kh2GMR steel plates, 100 x 100 x 8mm, at various heating conditions. High welding rates and small heating and cooling times result in size reduction of the metal structure in the thermal influence zone; this has a favorable effect on the strength and the impact ductility of the welded joint. At relatively high cooling rates, the joints do not show a tendency to the development of cold cracks. The mechanical properties of electron-beam welded joints are equal in quality to the initial material. The wide potentialities in varying the heat conditions in electron-beam welding make this

1/2

USSR

KASATKIN, B. S., et al., Avtomaticheskaya Svarka, No 7 (244), Jul 73, pp 4-8

welding method promising for industrial use in producing metal constructions from high-strength bainite steels. Recommendations are given for selecting optimum welding conditions for heat-treated low-alloy steels. Five figures, one table, seven bibliographic references.

2/2

USSR

UDC: 621.398

ZHIVITSIA, N. I., LYCHEV, V. N.

"A Device for Shaping a Group Signal in a Multichannel, Digital Data Transmission System"

USSR Author's Certificate No 314316, filed 6 Jan 70, published 4 Jan 72  
(from RZh-Avtomatika, Telemekhanika i Vychislitel'naya Tekhnika, No 7,  
Jul 72, Abstract No 7A214 P)

Translation: A device is patented for shaping a group signal in a multi-channel digital data transmission system with time multiplexing. The device contains binary logic multipliers of informational and auxiliary signals represented by Rademacher functions. To provide for simultaneous transmission of several data signals with multiple keying speeds, the data signals are sent to the inputs of each following logic multiplier from the output of the preceding multiplier or from an external input, together with auxiliary binary signals of a frequency double that of the signal sent to the preceding multiplier. Two illustrations.

1/1

- 14 -

USSR

UDC: 535.37+621.373:535

RUBINOV, A. N., TOMIN, V. I., and ZHIVNOV, V. A.

"Shifting of the Molecular Fluorescence Spectrum in the Light Field of a Laser of Nonresonant Frequency"

Leningrad, Optika i Spektroskopiya, No 4, October 1973, pp 778-779

Abstract: A new effect is reported in this brief communication -- a shift in the spectrum of fluorescent organic molecules in solution under the action of nonresonant laser radiation. The experiment detecting this effect was conducted with a solution of  $10^{-5}$  m/l of 4-amino-N-methylphthalamide in glycerin, with the fluorescence in the solution excited by the second harmonic radiation of a ruby laser. A drawing of the absorption spectrum and the fluorescence, originally photographed from an ISP-22 spectroscope, is shown. It was found that the fluorescence spectrum was substantially shifted toward the short wave end if, in addition to the second-harmonic ruby laser radiation, the solution was put under laser radiation of the fundamental frequency. The authors think that this shift is connected with the quenching of the fluorescence and is of a solvatochromic nature.

1/1

UDC 616--001.49

USSR

ZHIVOGLYADOVA, L. M., Kirgiz Scientific Research Institute of Mother and Child Care

"The Protective Effect of TMB-4 in Cases of Chlorophos Poisoning, as Related to Age"

Frunze, Sovetskoye Zdravookhraneniye Kirgizii, No 5, Sep/Oct 71, pp 27-30

Abstract: An attempt was made to learn the possibilities of using TMB-4, a cholinesterase reactivator, for poisoning in different age groups. Experiments were conducted with 12 5-10-day-old puppies and 12 grown dogs. Toxic manifestations were different in puppies and grown dogs with the same dose of chlorophos. In puppies, they were characterized by a few severe symptoms, while in dogs they were typical symptoms of organophosphorus poisoning. Signs of poisoning were considerably milder in both age groups when administration of chlorophos was combined with doses of TMB-4. It was also found that restoration of inhibitory enzymes takes place more slowly in puppies than in dogs, both in the presence and absence of TMB-4. The immaturity of a puppy's organism seemed to be the factor influencing the difference in response.

1/1

51

USSR

UDC 517.949.25

BYUKOV, YA. V., ZHIVOGLYADOVA, L. V., SHEVTSOV, YE. I.

"Sufficient Conditions for the Oscillatory Nature of Solutions of Nonlinear Finite-Difference Equations"

Minsk, Differentsial'nyye Uravneniya, Vol IX, No 8, 1973, pp 1523-1524

Abstract: The function  $u(n)$  ( $n = 0, 1, 2, \dots$ ) is called nonoscillatory if there is a number  $n_0$  such that for all  $n \geq n_0$  either  $u(n) > 0$  or  $u(n) < 0$ . Otherwise the function  $u(n)$  is said to be oscillatory.

The conditions of existence of oscillatory solutions of linear finite-difference equations were studied previously [M. A. Skalkina, Izv. vuzov, matematika, No 6, 138-144, 1959; A. L. Teptin, Izv. vuzov, Matematika, No 2, 120-123, 1963; Doklady III Sibirskoy konferentsii po matematike i mekhanike, Tomsk, 1964, pp 164-165; Izv. vuzov, Matematika, No 4, 140-146, 1965; Differents. uravneniya, Vol 1, No 4, 1965; Vol 2, No 11, 1966]

In the present paper a study has been made of the conditions for the oscillatory nature of the solutions of the nonlinear equation

$$\Delta[r(n)\Delta u(n)] + a(n)f[n, u(n), u(n+1)] + F[n, u(n), u(n+1)] = 0,$$

$\Delta v(n) \equiv v(n+1) - v(n) \cdot r(n)$ ,  $a(n)$ ,  $f(n, u, v)$ ,  $F(n, u, v)$  defined in the region  $n = 0, 1, 2, \dots$ ,  $-\infty < u, v < +\infty$ .

1/2



USSR

BYUKOV, YA. V., et al., *Differentsial'nyye Upravneniya*, Vol. IX, No 8, 1973, pp 1523-1524

It is assumed everywhere that when  $n \geq n_0$ ;  $u, v > 0$ :

$f(n, u, v) \geq 0$ ;  $f(n, -u, -v) \leq 0$ ;  $F(n, u, v) \geq 0$ ;  $F(n, -u, -v) \leq 0$ .

2/2

- 5 -

USSR

UDC 517.949

BYKOV, Ya. V., ZHIVOGLYADOVA, L. V., Krasnodar Polytechnical Institute

"Concerning the Oscillatory Nature of Solutions of Nonlinear Finite-Difference Equations"

Minsk, Differentsial'nyye Uravneniya, Vol 9, No 11, Nov 73, pp 2080-2081

Abstract: The paper establishes sufficient conditions for oscillatory behavior of solutions of the equation  $\Delta^2 u(n) + a(n)f[n, u(n), u(n+1)]\psi[n, u(n), v(n)] + \bar{F}[n, u(n), u(n+1)] = 0$ ;  $v(n) \equiv \Delta u(n)$ .

1/1

1/2 015 UNCLASSIFIED PROCESSING DATE--30OCT70  
TITLE--ONE MORE SOURCE OF THE ADDITIONAL STRUCTURE OF DIPOLE RESONANCES  
-U-  
AUTHOR--(05)-ZHIVOPISTSEV, F.A., NAGAR, N.EL., SHITIKOVA, K.V., YUDIN,  
N.P., AKBARY, M.Y.  
COUNTRY OF INFO--USSR  
SOURCE--PHYS. LETTERS (NETHERLANDS), VOL. 318, NO. 6, P. 347-9 (16 AMRCH  
1970)  
DATE PUBLISHED--16MAR70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--DIPOLE INTERACTION, NUCLEAR ENERGY LEVEL, NUCLEAR RESONANCE,  
INELASTIC SCATTERING, PARTICLE INTERACTION, ELECTRON HOLE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--1992/0442

STEP NO--NE/0000/70/031/006/0347/0349

CIRC ACCESSION NO--AP0111635

UNCLASSIFIED

2/2 015  
CIRC ACCESSION NO--AP0111635

UNCLASSIFIED

PROCESSING DATE--30OCT70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. STRUCTURE ARISING FROM THE  
COUPLING OF 3 PRIME NEGATIVE STATES WITH PARTICLE HOLE STATES IS  
CALCULATED. FACILITY: MOSCOW STATE UNIV., USSR.

UNCLASSIFIED

Water Treatment

USSR

UDC 628.34

ZHIVOPISTSEV, V. P., PETROV, B. I., and PONOSOV, I. N.

"Concentration of Radiochemical Research Wastes and Radioactive Decontamination of Waste Water by Using Diantipyrylmethane"

Leningrad, Radiokhimiya, Vol 12, No 4, 1970, pp 631-635

Abstract: The authors investigated diantipyrylmethane extraction of elements into chloroform in an thiocyanate system using elimination of cobalt from the waste solutions of radiochemical research as a specific example. It was shown that diantipyrylmethane is an effective extracting agent for Co-60, and it can be used for extraction and separation of radioactive elements and decontamination without a carrier. A method was developed for radioactive decontamination of water solutions accumulated in the process of radiochemical research and containing radioactive cobalt and other elements which are capable of forming fairly stable metal-thiocyanate complex anions (tin, iron, zinc, molybdenum, zirconium).

1/1

1/2 007 UNCLASSIFIED PROCESSING DATE--23OCT70  
TITLE--CATALYTIC PROPERTIES OF CHLOROPLAST PEROXIDASE -U-  
AUTHOR--(03)-RUBIN, B.A., VORONKOV, L.A., ZHIVOPISTSEVA, I.V.  
COUNTRY OF INFO--USSR  
SOURCE--DOKL. AKAD, NAUK SSSR 1970, 190(6), 1483-5  
DATE PUBLISHED-----70  
SUBJECT AREAS--AGRICULTURE  
TOPIC TAGS--CHLOROPLAST, CATALYSIS, PHOTOSYNTHESIS, PHOSPHORYLATION,  
OXIDASE  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--1997/1099 STEP NO--UR/0020/70/190/006/1483/1485  
CIRC ACCESSION NO--AT0119958  
UNCLASSIFIED

2/2 007

UNCLASSIFIED

PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AT0119958

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. CHLOROPLAST PEROXIDASE FROM CORN LEAVES WAS 4-13PERCENT AS EFFECTIVE AS CYTOPLASMIC PEROXIDASE FROM THE SAME LEAVES IN CATALYZING OXIDN. WITH H SUB2 O SUB2, BUT WAS 55PERCENT AS EFFECTIVE IN CATALYZING OXIDN. WITH MOL O. THIS UNUSUAL PROPERTY OF CHOLORPLAST PEROXIDASE SUGGESTS THAT IT MAY PERFORM A SPECIFIC FUNCTION IN PHOTOSYNTHESIS, PERHAPS IN PHOTOPHOSPHORYLATION.

UNCLASSIFIED

4

USSR

UDC 621.391.2

ALEKSEYEV, V. A., ANTONETS, M. A., GATELYUK, E. D., ZHIVORA, P. S., IVANOV, B. S., KRYUKOV, A. YE., TIKHONOV, YU. A., YANKAVTSEV, M. V.

"Interference Correlometer using a Digital Computer"

Moscow, Radiotekhnika i elektronika, Vol XVII, No 2, 1972, pp 332-339

**Abstract:** Specific problems connected with the construction of a correlation detection system in which the receivers are located at a distance excluding the possibility of direct coupling with the correlator are discussed. The problems of constructing the interference correlometer with recording of the investigated signals at each point on magnetic tapes and calculation of the correlation function on a digital computer are considered. The peculiarities of calculating the correlation function connected with the application of superheterodyne receivers are noted, and results are presented from laboratory checking of the system. Satisfactory coincidence of the experimental and theoretical results was obtained. For 10 kilohertz  $< F < 75$  kilohertz and  $T = 30$  seconds, the correlation gain of the developed system  $Q \approx 1000$ . The investigated system can also be used for autocorrelation and cross correlation analysis of processes represented by electric signals and for spectral analysis of signals represented in analog form for multilevel quantization at a digital computer input.

1/1



USSR

UDC 577.158

GRIGOROV, L. N., ZHIVOTCHENKO, V. D., REMENNIKOV, S. M., RUBIN, L. B., and RUBIN, A. B., Biology Soil Faculty, Moscow State University and Physico-technical Institute, Moscow

"Oxidation of *Ectothiorhodospira shaposhnikovii* Cytochromes Induced by Ruby Laser Flashes"

Moscow, Molekulyarnaya Biologiya, No 5, 1971, pp 744-752

Abstract: Description of a differential spectrophotometer in which pulsed light from a ruby laser can excite photochemical or photobiological objects. The sensitivity of the device is about  $10^{-4}$  units of optical density with a time resolution of about  $10^{-7}$  sec. This device was used to study the oxidation of *Ectothiorhodospira shaposhnikovii* cytochrome C induced by a ruby laser 25 nanosecond flashes. Under aerobic conditions the kinetics of the oxidation process was exponential, whereas under anaerobic conditions it was the sum of two exponential components. Under both conditions complete oxidation of the cytochromes required at least two successive laser flashes at intervals of  $3 \cdot 10^{-4}$  sec.

1/1

USSR

UDC: 621.396.67

ZHIVOTOVSKIY, L. A.

"Optimum Polarization of a Receiving Antenna"

Moscow, Radiotekhnika i Elektronika, Vol 17, No 11, Nov 72, pp 2427-2428

Abstract: The author analyzes optimum polarization of a receiving antenna defined as the polarization which maximizes the power ratio of the useful signal to the sum of external interference and inherent noises in the receiver. It is found that the image of optimum polarization of a receiving antenna on a Poincare sphere lies on a great circle passing through the images of polarizations of signal and interference. The use of optimum polarization increases the effectiveness of useful signal reception against a background of intensive partially polarized interference. The results of the paper can be used in designing antenna devices in communications and radar systems.

1/1

USSR

UDC 621.391.2

ZHIVOTOVSKIY, L. A.

"Polarization State of Signals Reflected From a Group of Independently Fluctuating Targets"

Moscow, Radiotekhnika i Elektronika, Vol 17, No 10, 1972, pp 2184-2186

Abstract: A study was made of the polarization state of signals reflected from a group of independently fluctuating targets. The case of a group of two independent fluctuating targets is considered where the radar pulses reflected from these targets in the aperture of the antenna system of the radar can be represented as samples from uncorrelated quasimonochromatic partially polarized waves  $s_1$  and  $s_2$  not containing deterministic components. The method of extending the results of the analysis to the case of more than two independently fluctuating targets is described. The polarization image of the aggregate wave on the Poincare sphere in the case of  $n > 2$  is defined using simple geometric constructions. The case of  $n = 3$  is outlined and the analogy is drawn for any value of  $n$ .

1/1

USSR

UDC 621.355.2.035.24

BESSONOVA, T. M., BOL'SHAKOVA, N. V., ZHIVOTINSKIY, P. B.

"Variation of the Structure of Porous Plates of Lead Batteries During Operation"

Sb. rabot po khim. istochnikam toka. N.-1. akkumulyator. in-t (Collected Works on Chemical Current Sources. Scientific Research Battery Institute), 1971, vyp. 6, 28-34 (from RZh-Khimiya, No 6 (II), Jun 72, Abstract No 6L243)

Translation: The variations in volumetric porosity, diameters and the coefficient of convolution of the pores and also the gas filling of the positive and negative plates during charge and discharge of starter lead batteries with different assembly density are defined.

1/1

- 7 -

USSR

UDC: 621.317.757

BALAKHANOV, V. Ya. and ZHIVOTOV, V. K.

"Spectrum Analyzer for Investigating Plasmas in the UHF Range"

Kiev, Izvestiya VUZ--Radioelektronika, Vol 13, No 11, 1970, pp 1291-1296

Abstract: This article discusses problems of the design of a spectrum analyzer for measuring plasma radiation close to the Langmuir frequencies. Such measurements are of interest in diagnostics and general plasma theory with nonlinear effects taken into account. The analyzer dealt with here is designed for measuring spectra within broad limits, of the order of octaves, and hence need not have high spectral resolution. As the basis of their design, the authors use the principle of holographic Fourier spectroscopy in the optical and quasi-optical ranges. The basic schematic of the analyzer is shown; its detectors, set along the longitudinal axis of a rectangular waveguide, measure the electric field of the electromagnetic waves to be analyzed. The latter are admitted into the waveguide and are reflected at its closed end to produce interference effects. The results of experiments conducted with an analyzer of this design are given, and it is concluded that it is fully acceptable for plasma work.

1/1

1/2 033  
UNCLASSIFIED  
TITLE--EXPERIMENTAL USE OF INTRACORNEAL PLASTIC LENSES -U- PROCESSING DATE--02OCT70  
AUTHOR--ZHIVOTOVSKIY, D.S.  
COUNTRY OF INFO--USSR  
SOURCE--VESTNIK OFTAL'MOLOGII, 1970, NR 2, PP 34-38  
DATE PUBLISHED-----70  
SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES  
TOPIC TAGS--OPTIC LENS, CORNEA, PLASTIC, SURGICAL IMPLANT, OPHTHALMOLOGY  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--1986/0836  
STEP NO--UR/0357/70/000/002/0034/0036  
CIRC ACCESSION NO--AP0102798  
UNCLASSIFIED

2/2 033

UNCLASSIFIED

PROCESSING DATE--02OCT70

CIRC ACCESSION NO--AP0102798

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. STAMPED LENSES OF ORGANIC GLASS, GRADE CT 1 AND JICO M, WITH A DIAMETER OF 4 TO 10 MM AND 0.05 TO 0.6 MM THICK WERE IMPLANTED BETWEEN CORNEAL LAYERS IN 120 RABBIT EYES. THE POSITIVE REFRACTION LENSES INSERTED NUMBERED 67, THE NEGATIVE ONE, 33 (0.5 TO 30 D) AND THE NEUTRAL LENSES, 20. TRANSLUCENT "TAKE" OF THE IMPLANTS WAS ACHIEVED IN 42.4 PERCENT OF THE CASES. CHANGES IN THE CLINICAL REFRACTION OF THE EYE, WHICH DEPENDED UPON THE THICKNESS, DIAMETER AND REFRACTION OF THE LENS, WITH FOLLOW UP PERIODS OF UP TO 1 YEAR WERE SEEN TO OCCUR IN ALL THESE INSTANCES. THE MOST SERIOUS POSTOPERATIVE COMPLICATIONS APPEARING OVER A SPACE OF FROM 5 TO 90 DAYS WAS THE EMERGENCE OF DYSTROPHIC ULCERS ABOVE THE LENSES, WHICH HEAL LEAVING BEHIND THEM A VASCULARIZED SCAR, OR ELSE ARE ATTENDED BY PROLAPSE OF THE KERATOPROSTHESES. THE EYE TOLERATES BEST LENSES WITH POSITIVE REFRACTION, LESS SO NEUTRAL LENSES, AND VERY POORLY LENSES WITH NEGATIVE REFRACTION. IN THE AUTHOR'S OPINION SUCH COMPLICATIONS ARE CAUSED BY THE PRESSURE WHICH IMPLANTS EXERT ON THE CORNEAL STRUMA. THE EXTENT OF THIS PRESSURE IS DETERMINED BY GEOMETRIC SHAPES, REFRACTION OF THE LENSES AND THE DEPTH AT WHICH THEY ARE SEATED IN THE CORNEAL LAYERS.

UNCLASSIFIED

USSR

UDC:621.762.4.04

ZHIVOV, L. I., SKORNYAKOV, YU. N. and NOTYCH, A. A., Zaporozhye Machine  
Building Institute imeni V. YA. Chubar'

"Study of the Process of Hot Extrusion of Sintered Materials"

Kiev, Poroshkovaya Metallurgiya, No 2, Feb 74, pp 23-28

Abstract: The fact that not only dimensions but also volume change when porous sintered materials are deformed makes the nature of shape change and force mode somewhat different in comparison to the deformation of monolithic metals and alloys. This article studies the process of even deformation of a porous cylindrical briquette compacted in a container. The theory of plastic flow is used to analyze the process of compacting of the porous material. As a second phase of the process of hot extrusion, the ejection of the compacted material through the extrusion aperture is studied. The study establishes the relationship between the degree of deformation during extrusion and the residual porosity of the extruded piece.

1/1

- 25 -



USSR

UDC 621.762.4:621.77.2

PAVLOV, V. A., ZHIVOV, L. I., SHCHERBINA, V. V., LYASHENKO, A. P.,  
PETRYKINA, R. YA., LITVIN, Zaporozh'ye Machine Building Institute imeni  
V. Ya. Chubar'

"Hot Extrusion of Powdered Titanium"

Kiev, Poroshkovaya Metallurgiya, No 8, Aug 73, pp 15-19

Abstract: Hot extrusion of titanium powder was studied using a 1600 ton-force crank press. The raw powder, sintered billets, and, for comparison, sheet titanium were extruded. Both open and closed dies were used. It was observed that there was a decrease in grain size with a simultaneous increase of their total surface area, promoting intensification of intergranular diffusion which occurs with a significant increase in the diffusion rate, caused by the high specific force and temperature ( $950^{\circ}\text{C}$ ). Mechanical properties of briquets extruded at  $950^{\circ}\text{C}$  and heat treated by annealing at  $750^{\circ}\text{C}$  for three hours in a vacuum of  $2 \cdot 10^{-4}$  mm Hg are compared with briquets which were vacuum sintered at  $1200^{\circ}\text{C}$  for three hours prior to extruding and given the same heat treatment as stated above after extruding. Density and mechanical properties of the vacuum sintered briquets is slightly higher than the non-vacuum sintered briquets but not enough to warrant the additional  
1/2

USSR

PAVLOV, V. A., et al., Poroshkovaya Metallurgiya, No 8, Aug 73, pp 15-19

cost of vacuum sintering. The introduction of extruded powder-titanium parts and titanium-alloy powder parts to replace cast parts will result in increased savings by using a less expensive raw material, shortening of intermediate operations, increased die strength, increased labor productivity, and decreased metal losses. Three figures, one table, three bibliographic references.

2/2

- 47 -

Powder Metallurgy

USSR

UDC: 621.77.2

ZHIVOV, L. I., PAVLOV, V. A., SHCHERBINA, V. V., KOLESNIK, F. I. and  
MAKOGON, V. N., Zaporozh'ye Machine Building Institute

"Conditions for Hot Extrusion of Rods From Cermet Titanium"

Kiev, Poroshkovaya metallurgiya, No 11, Nov 71, pp 16-21

Abstract: Rods and shapes of intricate cross sections with a density close to monolithic metal may be produced from pre-compressed titanium powder briquettes with the use of appropriate equipment and the knowledge of the power energy parameters of hot extrusion (including force and work of deformation). Characteristic of hot forming of powdered metals and specifically of titanium powder is the fact that the density of the briquette in the first (nonstationary) phase of extrusion is lower than that of monolithic metal. In the second, quasi-stationary region, the densities of both the cake and the finished product are commensurate and approach that of monolithic metal. The stress-deformation relationship characteristic of a solid metal may be applied with reasonable accuracy to powdered materials. Considered here is the hot extrusion of pure titanium

1/2

USSR

ZHIVOV, L. I., et al, Poroshkovaya metallurgiya, No 11, Nov 71, pp 16-21

powders and those alloyed with tungsten carbide (up to 30%). Use is made of correction coefficients for crank press tests to correlate the data on stresses and deformations by simple mathematical relationships. A nomograph is proposed for rapid determination of both specific and over-all stresses of extrusion of cermet materials. (5 illustrations, 1 table, 2 bibliographic references).

2/2

- 32 -

USSR

UDC 532.517.4:532.526

KORTIKOV, N. N., ~~ZHIVOV, M. Z.~~, and SOKOVISHIN, Yu. A., Leningrad Polytechnic Institute imeni M. I. Kalinin

"A Wall Jet on a Curved Surface"

Minsk, Inzhenerno-Fizicheskiy Zhurnal, Vol 22, No 5, 1972, pp 881-884

Abstract: The paper deals with the propagation of a two-dimensional jet of incompressible fluid on a curved surface, spurting from a thin slit into a space occupied by the same fluid. The calculations are conducted by numerical methods by means of the profile used by N. I. Akatnov for a two-dimensional wall jet in the initial cross section. The calculation results are processed in the form of dimensionless profiles of the velocity and friction stress on the wall. It is shown that restructuring of the boundary layer takes place in the initial cross section. The calculation results are compared with those obtained by the method of perturbations. The low exactness of the method of perturbations is shown. 1 figure. 6 references.

1/1

USSR

ANDRIYEVSKAYA, S. V., DARKHOVSKIY, B. S. and ZHIVOV, N. P.

"The Problem of Testing Deviations in Production Processes"

Inform. Metody v Sistemakh Upr. Izmereniy i Kontrolya. T. 1. [Information Methods in Control, Measurement and Testing Systems, Vol 1 -- Collection of Works], Vladivostok, 1972, pp 417-424 (Translated from Referativnyy Zhurnal Kibernetika, No 9, 1973, Abstract No 9V807).

Translation: The following problem is studied. The input vector  $u$  acts on initial system  $S$  in which it is converted to output vector  $y$ . System  $S$  itself is not subject to any deviations. Operator  $F$ , at the input of which vector  $u$ ,  $y$  and external factor  $z$ , independent of  $u$  and  $y$  act, forms deviation  $R$  according to some rule. Deviation  $R$  acts on system  $S$ , changing its characteristics in the broad sense of this word. It is necessary, by observing vector  $y$  and knowing certain a priori information concerning  $u$ ,  $z$  and operator  $F$ , to find deviation  $R$  as rapidly as possible.

1/1

USSR

UDC: 681.327

BOCHKIN, Yu. Ya., ZHIVOV, N. P., KUBANIN, Yu. Z., MOROZOV, V. Ye., RYZIKOV, M. L., Central Scientific Research Institute of Large-Scale Automation

"Pneumoelectronic Accumulator of Statistical Information"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 13, May 72, Author's Certificate No 335705, Division G, filed 29 Jun 70, published 11 Apr 72, p 211

Translation: This Author's Certificate introduces a pneumoelectronic accumulator of statistical information. Connected to the input channels is a pneumocommutator controlled by an address selection module. This commutator is connected in series to a normalizer. The accumulator also contains an analog-digital converter connected through a counter to a data output module whose output is connected to a printer and a puncher. The accumulator also includes a control unit connected to a timer, to the analog-digital converter, and to the data output module. As a distinguishing feature of the patent, in order to extend the range of signals which can be monitored and to simplify the design, an electric input signal commutator, normalizer, and adder are incorporated in the device. The con-

1/2

USSR

BOCHKIN, Yu. Ya. et al., USSR Author's Certificate No 335705

trolling input of the electric signal commutator is connected to the address selection module, and the output is connected through the extra normalizer to the adder. The output of the adder is connected to the analog-digital converter, and a second input of the adder is connected through the main normalizer to the pneumocommutator.

2/2

- 27 -



USSR

UDC: 534

ZHIVOV, V. A., RYKOV, V. I., YAKOVLEVA, G. S.

"Concerning Application of the Law of Corresponding States to Investigation of the Acoustic Characteristics of a Liquid"

V sb. Primeneniye ul'trakust. k issled. veshchestva (Application of Ultra-acoustics to the Study of Matter--collection of works), vyp. 25, Moscow, 1971, pp 222-225 (from RZh-Fizika, No 6, Jun 72, Abstract No 6Zh526)

Translation: The method of dimensional analysis is used to find expressions for the parameters of intermolecular interaction, and speeds of sound are calculated for a large number of normal liquids. When the structural coefficient is taken into account, the divergence between theoretical and experimental velocities amounts to 2%. Bibliography of 12 titles. V. Ye. Gordeyev.

1/1

USSR

UDC 532.526

VULIS, L. A., DZHAUGASHTIN, K. YE., ZHIVOV, V. G., YARIN, L. P., Leningrad

"Propagation of a Stream of Viscous Liquid in a Medium with a Density Discontinuity"

Moscow, Zhurnal Prikladnoy mekhaniki i tekhnicheskoy fiziki, No 3, 1972, pp 115-122

Abstract: A study was made of the propagation of laminar and turbulent streams in a medium containing a density discontinuity. The results of an experimental study of the propagation laws of flows of a viscous fluid in such a medium are discussed for variation of the Reynolds numbers in the range of  $25 < R < 20 \cdot 10^3$ . In addition to streams normal to the surface of the discontinuity (vertical), horizontal streams propagated along the interface of the heavy and light liquids (the discontinuity surface) were also investigated. Photographs and results are presented for measuring the dynamic pressure illustrating properties of the investigated streams which are unusual for a homogeneous environment -- suppression of turbulence, the presence of a limiting length of the stream, its anisotropy, and so on. An approximate explanation of the observed effects is presented within the framework of boundary layer theory in addition to the semiempirical theory of turbulence.

1/1

- 48 -

1/2 023  
TITLE--ANOMALOUS CHANGE IN THE STRENGTH OF RUBBERS DURING THEIR  
INTERACTION WITH WATER -U-  
AUTHOR-(02)-PAYEVSKIY, V.G., ZHIVOVA, E.A.  
COUNTRY OF INFO--USSR  
SOURCE--MEKH. POLIM. 1970, 6(1), 136-8  
DATE PUBLISHED-----70  
SUBJECT AREAS--MATERIALS  
TOPIC TAGS--NATURAL RUBBER, BUTYL RUBBER, WATER, MECHANICAL STRENGTH,  
RUPTURE STRENGTH  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAME--1989/0814  
CIRC ACCESSION NO--AA0107356  
STEP NO--UR/0374/70/006/001/0136/0138  
UNCLASSIFIED

2/2 023

UNCLASSIFIED

PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AA0107356

ABSTRACT/EXTRACT--(U) GP-0-

ABSTRACT. THE TEAR RESISTANCE (SIGMA) OF NATURAL RUBBER BUTYL RUBBER MIXT. (I) DOES NOT CHANGE WHEN SMALLER THAN OR EQUAL TO 21PERCENT WATER IS ABSORBED. HOWEVER, AFTER DRYING I, WHICH ABSORBED 12.9PERCENT WATER, SIGMA INCREASED FROM SIMILAR TO 7.5 TO SIMILAR TO 9.4 KG-CM. THIS CAN BE EXPLAINED BY THE IDEA THAT THE WATER IS TAKEN UP BY I ONLY THROUGH THE CAPILLARY MICROFISSURES WHICH EXPAND. THE EXPANSION CAUSES THE ORDERING OF I STRUCTURE WHICH PERSISTS AFTER DRYING AND STRENGTHENS THE RUBBER. ALTERNATIVELY (OR CONCURRENTLY) WATER REMOVES FROM THE INSIDE CAPILLARY WALLS A FILM OF D CONTG. IMPURITIES. THIS INCREASES THE TACKINESS OF THE WALLS WHICH THEREFORE STICK TOGETHER AFTER DRYING, SEALING THE MICROFISSURES WHICH ARE PRINCIPALLY RESPONSIBLE FOR THE MECH. FAILURE OF I. FACILITY: GOS. NAUCH-ISSLED, PROEKT. INST. POLIM. KLEEV IM, TER-GAZARYANA, KIROVAKAN, USSR.

UNCLASSIFIED

1/2 036 UNCLASSIFIED PROCESSING DATE--02OCT70  
TITLE--PRESSING OF COPPER BORON NITRIDE TUBES -U-  
AUTHOR--(Q31)-ZHIVOV, L.I., SKURNYAKOV, YU.N., PAVLOV, V.A.  
COUNTRY OF INFO--USSR  
SOURCE--POROSHKOVAYA MET., JAN. 1970, (1), 92-97  
DATE PUBLISHED-----70  
SUBJECT AREAS--MATERIALS, MECH., IND., CIVIL AND MARINE ENGR  
TOPIC TAGS--BORON NITRIDE, COPPER, CERMET, REFRACTORY COMPOUND, CERAMIC  
PROCESSING, CERAMIC PRESSING, DEFORMATION RATE, COPPER TUBE  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FAME--1990/1287 STEP NO--UR/0226/70/000/001/0092/0097  
CIRC ACCESSION NO--AP0109371  
UNCLASSIFIED

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036

UNCLASSIFIED

PROCESSING DATE--02JCT70

CIRC ACCESSION NJ--AP0109371  
ABSTRACT/EXTRACT--(U) GP-0-

ABSTRACT. THE GENERAL PRINCIPLES UNDERLYING THE HOT PRESSING OF HOLLOW TUBULAR ELECTRODES FROM CU-BN CERMETS ARE DISCUSSED. SPECIAL ATTENTION IS REQUIRED IN RELATION TO OPTIMIZATION OF THE PRESSING PARAMETERS (APPLIED STRESS, RATE OF DEFORMATION, ETC.). THE APPLIED PRESSURE IS PARTLY GOVERNED BY THE DESIRED WALL THICKNESS OF THE TUBE; TYPICAL CASES INVOLVE TUBES OF DIA. 1C-20 AND WALL THICKNESSES 1-8 MM. SUBJECT TO PROPER CONDITIONS THE CU COMPONENT OF THE TUBULAR ELECTRODES IS PROTECTED FROM ELECTRICAL DAMAGE (IN PAK DISCHARGES) BY THE REFRACTORY BN COMPONENT. G. A.

UNCLASSIFIED

2/2 006

UNCLASSIFIED

PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AP0137965

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A 65PERCENT YIELD OF  
CHLOROPHOSPHAZENES (I), (PNCL SUB2) SUBN, FORMED WITHIN A FEW MIN IN THE  
REACTION OF PCL SUB5 WITH NH SUB4 CL IN MIXT. CONTG. 4 MOLES PYRIDINE  
PER MOLE OF PCL SUB5. IN THE PRESENCE OF AN INERT SOLVENT, SUCH AS  
PHCL, THE REACTION WAS SLOWER BUT THE YIELD OF CRYST. I WAS 80-5PERCENT  
WITHIN 5-8 HR.

UNCLASSIFIED

USSR

UDC 51:330.115

KANTOROVICH, L. V., Academician, and ZhiYanOV, V. I., Institute of the Management of the National Economy, Moscow

"A Single-Product, Dynamic Model of the Economy, Considering the Change in Fund Structure Occurring with Technical Progress"

Moscow, Doklady Akademii Nauk SSSR, Vol 211, No 6, 21 Aug 73, pp 1280-1283

Abstract: The model is constructed in stages: 1) a basic expression for production in terms of available resources and labor; 2) a factor for technical progress, such that the production value of a given amount of capital expenditure is an exponential function of the time at which the expenditure is made; 3) a factor for additional investment (capital and labor) made available by the recovery of resources from obsolete activities; 4) a fund transfer lag function, expressing the necessary delay for the construction of capital equipment and the transfer of labor to new activities.

The factor to be optimized is chosen as  $\frac{dP(p)}{dt}$ , where P is pure production or national income and t is time. The model is then expressed by the following four equations:

1/3

- 11 -



USSR

KANTOROVICH, L. V., and ZhIYaNOV, V. I., Doklady Akademii Nauk SSSR, Vol 211, No 6, 21 Aug 73, pp 1280-1283

$$P(t) = \int_{m(t)}^t e^{\delta(\tau-L)} U[\lambda(\tau), 1] \phi(\tau) d\tau$$

$$\phi(t) = T'(t) \phi[m(t)] m'(t)$$

$$\lambda(t) \phi(t) = K(t-L)$$

$$\phi(t) U[\lambda(t) m] - K(t-L) U_x[\lambda(t), 1] - e^{\delta[m(t)-t]} \phi(t) U[\lambda[m(t)], 1] = 0;$$

where  $e^{\delta(\tau-L)}$  is the technological progress increment (L is the lag factor);

USSR

KANTOROVICH, L. V. and ZhiYANOV, V. I., Doklady Akademii Nauk SSSR, Vol 211, No 6, 21 Aug 73, pp 1280-1283

$U$  is the production function,  $\phi(\tau)d\tau$  is the incremental labor demand,  $\lambda(\tau)\phi(\tau)d\tau$  is the incremental created resources,

$T'(t)$  is the increment in labor resources,

$m(t)$  is a function determining a moment earlier than  $t$  such that all resources committed prior to  $t$  are liberated at  $m(t)$ ,

$\mathcal{K}(t)$  is the capital investment.

Considering a small increment of time, the model yields a criterion function for capital investment efficiency. A solution of the equations to yield a function such that  $U(x,y)$  is a Cobb-Douglas function is given in the article.

3/3

Hydraulic and Pneumatic

USSR

LEVSH, I. P. ZHIYAZOV, M. I., UBAYDULLAEV, A. K., MISHINA, V. N., MUKHITDINOV, KH. KH.

"Mass Transfer and Hydrodynamics in 3-phase Fluidized Bed Using Various Fillers"

Gidrodinamika, Teplo- i Massoobmin v Psevdozhizh. Sloye [Hydrodynamics, Heat and Mass Transfer in Fluidized Bed], Ivanovo, 1971, pp 202-207. (Translated from Referativnyy Zhurnal Mekhanika, No 1, 1972, Abstract No 1B1121, by V. A. Kernerman).

Translation: Studies involving fluidization of sprinkled packing (plastic rings, hollow balls and cubes) in three gas-liquid systems on grid plates and overflow plates in apparatus 145 to 300 m in diameter have shown that in the initial period of fluidization of the filler in the 3-phase layer, 10-15 times greater phase contact surface is created than in a bubbling layer without filler. Movement of the filler and pulsating fluid drain through the holes in the plates facilitate intensive renewal of the phase contact surface and increased mass transfer rates. Data are presented on the influence of gas flow rate and sprinkling density on bed resistance and dynamic layer height, as well as the observed values of mass transfer coefficients and the contact surface between phases calculated according to the method suggested. 13 biblio refs.

1/1

USSR

UDC 669.71.48

VASHCHENKO, K. I., FIRSTOV, A. N., ZHIZHCHENKO, V. V.

"Improving the Quality of Secondary Aluminum Alloys"

Usadochn. protsessy v splavakh i otlivkakh -- V sb. (Shrinkage Processes and Alloys and Castings -- collection of works), Kiev, Naukova Dumka Press, 1970, pp 274-277 (from RZh-Metallurgiya, No 4, Apr 71, Abstract No 4G196)

Translation: The effect of degassing and refining on the mechanical and casting properties of secondary AL9V and AL10V alloys is investigated. The quality of secondary alloys is improved by effective methods of degassing and refining the alloys, for example, evacuation and blowing of the alloys with Ar as a result of which the gas porosity is decreased sharply and the water tightness and mechanical properties of the alloys are improved. There are 2 tables.

1/1

172 041 UNCLASSIFIED PROCESSING DATE--13NOV70  
TITLE--DISLOCATING STRUCTURE AND OPTICAL HETEROGENEITIES OF YTTRIUM  
ALUMINUM GARNET SINGLE CRYSTALS -U-  
AUTHOR--(05)-DEDUKH, L.M., ZHIZHEYKO, I.A., BAGDASAROV, KH.S., KEVORKOV,  
A.M., NIKITENKO, V.I. **2**  
COUNTRY OF INFO--USSR  
SOURCE--KRISTALLOGRAFIYA 1970, 15(2), 334-41  
DATE PUBLISHED-----70

SUBJECT AREAS--MATERIALS, EARTH SCIENCES AND OCEANOGRAPHY, PHYSICS

TOPIC TAGS--GARNET, SINGLE CRYSTAL, CRYSTAL DISLOCATION, YTTRIUM COMPOUND,  
LASER PROPERTY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--2000/1570

STEP NO--UR/0070/70/015/002/0334/0341

CIRC ACCESSION NO--AP0125196

UNCLASSIFIED

UNCLASSIFIED

PROCESSING DATE--13NOV70

2/2 041

CIRC ACCESSION NO--AP0125196

ABSTRACT/EXTRACT--(U) GP-0-

ABSTRACT. DISLOCATIONS WERE OBSD. BY MEANS OF AN OPTICAL POLARIZATION STUDY OF THE BIREFRINGENCE RELATED TO SINGLE DISLOCATIONS IN Nd PRIME3 POSITIVE DOPED Y SUB3 AL SUB5 O SUB12 SINGLE CRYSTALS. THE INFLUENCE OF DISLOCATIONS OF THE LASER CHARACTERISTICS OF THE CRYSTAL IS DISCUSSED, AND A FURTHER STUDY OF OPTICAL INHOMOGENEITIES IS PRESENTED.

FACILITY: INST. KRISTALLORO., MOSCOW, USSR.

UNCLASSIFIED

USSR

UDC 533.916

ZHIZHIMOV, L. A., MAKARKIN, B. D.

"Resonance Extinction of Electromagnetic Waves by Plasma Objects in a Rarefied Plasma"

Tr. Kirg. un-ta. Ser. fiz. n. (Works of Kirgiz University. Physical Sciences Series), 1972, No. 1, pp 81-82 (from RZh-Fizika, No 11, Nov 72, Abstract No 11G213)

Translation: Formulas are obtained for the cross section for scattering and absorption of electromagnetic waves by plasma formations in a medium with finite conductivity. V. A. Abramov.

1/1

- 49 -

Acc. Nr.

170049882

Abstracting Service:  
CHEMICAL ABST. 5/10

Ref. Code

UR 002.0

105470t Spectroscopic manifestations of phase transitions in crystalline cyclopentane. Zhizhin, G. N.; Lozovik, Yu. E.; Moskalova, M. A.; Usmanov, A. (Inst. Spektrosk., Akademgorodok, USSR). *Dokl. Akad. Nauk SSSR* 1970, 190(2), 301-4 [Phys] (Russ). Phase transitions in mol. crystals cause changes in their ir spectra (width, intensity and splitting). The changes of bandwidth were used to det. phase transitions in cyclopentane. The absorption band was measured at 300-80°K. Sample thickness was 35 and 100  $\mu$ . The bandwidth decreased with decreasing temp. from 23 to 2.8  $\text{cm}^{-1}$ . Its plot vs. temp. shows discontinuities at the temps. of freezing and transitions into different cryst. modifications. Freezing appears at 179.5°K as a change in the slope of the line and as the temp. is lowered further transition from cryst. phase I to II at 128.1°K is manifested as a decrease of bandwidth by 2  $\text{cm}^{-1}$ ; at 122.4°K transition of phase II to III appears as a decrease in bandwidth by 7  $\text{cm}^{-1}$ . Anal. of the line segments corresponding to different phases allowed one to det. the barriers to rotational reorientations: 1.2 kcal/mole for the liq., 0.8 kcal/mole for phase I and 0.4 kcal/mole for phase II. In some of the samples of phase III dichroism could be obsd. by using polarized light. Roman Mykolajewycz

REEL/FRAME  
19801814



USSR

UDC 547.963.3

ZHIZHINA, G. P., VAYNSHTEYN, R. S., and BRAGINSKAYA, F. I., Institute of Chemical Physics, USSR Academy of Sciences, Moscow

"Study of Injury to DNA and DNP Caused by Ultrasound"

Moscow, Doklady Akademii nauk SSSR, No 5, 1973, pp 1193-1196

Abstract: Exposure of DNA to ultrasound for 1 to 10 minutes decreased the intensity of several absorption bands in the infrared spectra of the acid and resulted in the appearance of a new, unresolved band at  $1190\text{ cm}^{-1}$ . It also decreased the intensity of the  $1650$  and  $1590\text{ cm}^{-1}$  bands in the region of the oscillations of the double bonds of the bases as well as the intensity of the  $1010\text{ cm}^{-1}$  and  $960\text{ cm}^{-1}$  bands in the region of the oscillations of the sugar-phosphate skeleton of DNA. Deamination of the bases following slight prolongation of sonication did not occur because the intensities of the bands of oscillations of the amino groups of the bases ( $3350$ ,  $3200$ , and  $1605\text{ cm}^{-1}$ ) remained unchanged. Exposure of DNP to ultrasound decreased the intensity of several bands of the protein component:  $3300$ ,  $3200$ ,  $2940$ ,  $1450$ ,  $1550$ , and  $1400\text{ cm}^{-1}$ . The authors conclude that DNA in the DNP complex is highly resistant and that ultrasonic degradation of the complex begins only after partial injury to the protein coat of DNP.

1/1

- 49 -

USSR

UDC 577.1:547.963.3

ZHIL'TSOVA, V. M., ZHIZHINA, G. P., KRUGLYAKOVA, K. Ye., and GINDIN, L. G.,  
Institute of Chemical Physics, USSR Academy of Sciences, Moscow

"Structural Changes in Single-Strand DNA After Exposure to Ultraviolet Rays"

Moscow, Izvestiya Akademii Nauk SSR, Seriya Biologicheskaya, No 3, 1973,  
pp 432-435

Abstract: Ultraviolet irradiation of aqueous solutions of single-strand DNA (isolated from rat spleen) caused an exponential decrease in viscosity and optical density at 260 nm. Dimerization of the thymine bases and rupture of the polynucleotide chains resulted in partial twisting of the DNA strands.

1/1

- 72 -

ZHIZNEVSKAYA, G. YA.

Biology

INTERNATIONAL SYMPOSIUM ON BIOLOGICAL RHYTHMS IN NATION

Article by Doctor of Biological Sciences, G. Ya. Zhiznevskaya, and Doctor of Biological Sciences, G. Ya. Zhiznevskaya, Moscow, U.S.S.R. (Received 1971, pp. 9-17)

Vol. 10, No. 1

The International Symposium on the Biological Rhythms in Nation, which was held in Moscow, U.S.S.R., in 1971, was devoted to the study of the biological rhythms in the human organism. The symposium was held in the city of Moscow, U.S.S.R., in 1971, and was devoted to the study of the biological rhythms in the human organism. The symposium was held in the city of Moscow, U.S.S.R., in 1971, and was devoted to the study of the biological rhythms in the human organism.

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1/2 020 UNCLASSIFIED PROCESSING DATE--11DEC70  
TITLE--MUTUAL EFFECT OF OLEFINS ON THEIR OXIDIZABILITY OVER IRON ANTIMONY  
MOLYBDENUM OXIDE CATALYSTS -U-  
AUTHOR--(C3)-FEDEVICH, YE.V., ZHIZNEVSKIY, V.M., TOLCPKO, D.K.  
COUNTRY OF INFO--USSR  
SOURCE--UKR. KHIM. ZH. 1970, 36(4), 400-3  
DATE PUBLISHED-----70  
SUBJECT AREAS--CHEMISTRY  
TOPIC TAGS--OLEFIN, CATALYTIC OXIDATION, IRON, ANTIMONY, MOLYBDENUM,  
BUTENE  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY FICHE NO----FD70/605013/B07 STEP NO--UR/0073/70/036/004/0600/0403  
CIRC ACCESSION NO--AP0140351  
UNCLASSIFIED

2/2 020  
CIRC ACCESSION NO--AP0140351

UNCLASSIFIED

PROCESSING DATE--11DEC70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE RATIO OF FE, SB, AND MD ATOMS IN THE OXIDE CATALYST WAS 1:0.06:1. ON THIS CATALYST THE RATE OF OXIDN. DECREASED FROM ETCH:CH SUB2 TO ME SUB2 C:CH SUB2, TO MECH:CH SUB2. IF AS MUCH AS 10 MOLE PERCENT OF BUTYLENE WAS PRESENT OXIDN. OF MECH:CH SUB2 WAS SUPPRESSED. THIS IS INTERPRETED AS INDICATING THAT CATALYSIS OPERATES BY AN ADSORPTION AND NOT BY A RADICAL MECHANISM. THE GREATER RATE FOR ETCH:CH SUB2 OVER THAT OF ME SUB2 C:CH SUB2 IS ATTRIBUTED TO THE GREATER REACTIVITY OF SECONDARY H ATOMS. FACILITY: L'VOV POLITEKH. INST., LVOV, USSR.

UNCLASSIFIED

UDC 678.674.004.14:621.397

6

USSR

SED OV, I. N., VLADIMIROVA, Z. V., SAPOZHNIKOVA, YE. L., MAKEYEVA,  
A. A., SEMENOV, L. G., MAK-MILLIN, D. M., BAKANOV, YU. A.,  
DIDZHYULENE, D. I., MALKINA, F. S., and ZHLABIS, S. B.

"Polyester Hermetic-Sealing Compounds"

Moscow, Plasticheskiye Massy, No 6, 1970, pp 61-62

Abstract: The authors studied compounds for the hermetic sealing of horizontal output transformer coils for television receivers. These compounds should have low viscosity in the initial state and a high hardening rate up to 100°C. In the hardened state they should possess self-extinguishability, water resistance, good mechanical and electric insulation properties, and stability of properties up to 120°C. The principal components chosen were polyester resins PN-1 and PN-69. Because of the requirement of self-extinguishability, special additives (antimony trioxide and chlorine- or fluorine-containing polymers) were introduced into the resins. In addition, mineral fillers (talc, mica, powdered quartz, titanium dioxide, powdered silica gel, etc.) were added to give the sealing compounds

1/2

USSR

SEDOV, L. N., et al, Plasticheskiye Massy, No 6, 1970, pp 61-62

the requisite viscosity and to lower their cost. The article gives data on the hermetic sealing process. These self-extinguishing compounds are being used for the hermetic sealing of horizontal output transformers for black-and-white (1 class) and color television sets and viewing monitors.

2/2

- 93 -

USSR

ZHLEZNOV, N. A.

UDC 51:621.391

"On Essential Properties of Models of Physical Signals and Limiting Values of Their Basic Parameters"

Tr. Leningr. in-t aviats. priborostr. (Works of Leningrad Institute of Aircraft Instrument Building), 1972, No 74, pp 3-10 (from RZh-Matematika, No 11, Nov 72, Abstract No 11V378)

Translation: The essential properties of physical signals which should be retained in a model to avoid the rise of paradoxes are formulated. The basic properties involved here include the following: (1) random functions are finite i.e., of limited duration  $T$ ; (2) the average energy is limited; (3) the predominant portion of the energy is concentrated in the effective frequency band  $\Delta f_e$ ; (4) in the general case the process is nonstationary relative to the correlation function. Two basic parameters are introduced: (1) the number of fundamental components  $N_0$  having the property that they are finite, uncorrelated and carry the greatest possible portion of the energy of the signal; (2) the energy concentration coefficient  $K_e$  in  $\Delta f_e$ . Two methods for forming  $N_0$  are discussed: a sequential and a simultaneous method, leading to a Karunen-Loeve-Pugachev expansion. A fundamental



USSR

ZHLEZNOV, N. A., Tr. Leningr. in-t aviats. priborostr., 1972, No 74, pp 3-10

theorem giving the best (or asymptotically best) values for  $N_0$  and  $K$  is proved. It is shown that  $N_0 \leq [2\pi f_e]$  and that  $K_e$  under the simultaneous formation of the fundamental components can be as close to 1 as desired for sufficiently large  $N_0$ . It is shown that in the latter case the information of the initial signals is retained as completely as one wishes in the fundamental components. The condition under which the limiting values of the parameters are achieved is discussed. It is noted that the theorem makes it possible in using a Gaussian model to restrict oneself to a finite-dimensional approximation, which action avoids paradoxes in many important problems. Authors abstract.

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- 44 -

1/2 026

UNCLASSIFIED

PROCESSING DATE--30OCT7.

TITLE--MASS SPECTROMETER DATA ON THE COMPOSITION OF THE IONOSPHERIC E

REGION -U-

AUTHOR--ZHLODDKO, A.D.

COUNTRY OF INFO--USSR

SOURCE--COSPAR, PLENARY MEETING, 13TH, LENINGRAD, USSR, MAY 20-29, 1970,  
PAPER. 13 P

DATE PUBLISHED--MAY70

SUBJECT AREAS--MISSILE TECHNOLOGY, ATMOSPHERIC SCIENCES

TOPIC TAGS--E LAYER, MASS SPECTROMETER, SOLAR FLARE, SOUNDING ROCKET,  
IONOSPHERIC STATION, CHEMICAL COMPOSITION/(U)MP12 MASS SPECTROMETER

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAE--3003/0875

STEP NO--UR/0000/70/000/000/0013/0013

CIRC ACCESSION NO--AT0129944

UNCLASSIFIED